

WHAT IS CLAIMED IS:

1. Seed of cotton line designated 02Z55, representative seed of said line having been deposited under ATCC Accession No. PTA-\_\_\_\_\_.
2. A cotton plant, or a part thereof, produced by growing the seed of claim 1.
3. A tissue culture of regenerable cells produced from the plant of claim 2.
4. Protoplasts produced from the tissue culture of claim 3.
5. The tissue culture of claim 3, wherein cells of the tissue culture are from a tissue selected from the group consisting of leaf, pollen, embryo, root, root tip, anther, pistil, flower, seed, boll and stem.
6. A cotton plant regenerated from the tissue culture of claim 3, said plant having all the morphological and physiological characteristics of line 02Z55, representative seed of said line having been deposited under ATCC Accession No. PTA-\_\_\_\_\_.
7. A method for producing an F1 hybrid cotton seed, comprising crossing the plant of claim 2 with a different cotton plant and harvesting the resultant F1 hybrid cotton seed.
8. A hybrid cotton seed produced by the method of claim 7.
9. A hybrid cotton plant, or parts thereof, produced by growing said hybrid seed of claim 8.
10. A method of producing a cotton seed by growing said hybrid cotton plant of claim 9 and harvesting the resultant seed.
11. A method for producing a male sterile cotton plant comprising transforming the cotton plant of claim 2 with a nucleic acid molecule that confers male sterility.
12. A male sterile cotton plant produced by the method of claim 11.
13. A method of producing an herbicide resistant cotton plant comprising transforming the cotton plant of claim 2 with a transgene that confers herbicide resistance.
14. An herbicide resistant cotton plant produced by the method of claim 13.

15. The cotton plant of claim 14, wherein the transgene confers resistance to an herbicide selected from the group consisting of: imidazolinone, sulfonylurea, glyphosate, glufosinate, L-phosphinothricin, triazine and benzonitrile.

16. A method of producing an insect resistant cotton plant comprising transforming the cotton plant of claim 2 with a transgene that confers insect resistance.

17. An insect resistant cotton plant produced by the method of claim 16.

18. The cotton plant of claim 17, wherein the transgene encodes a *Bacillus thuringiensis* endotoxin.

19. A method of producing a disease resistant cotton plant comprising transforming the cotton plant of claim 2 with a transgene that confers disease resistance.

20. A disease resistant cotton plant produced by the method of claim 19.

21. A method of producing a cotton plant with modified fatty acid metabolism or modified carbohydrate metabolism comprising transforming the cotton plant of claim 2 with a transgene encoding a protein selected from the group consisting of stearyl-ACP desaturase, fructosyltransferase, levansucrase, alpha-amylase, invertase and starch branching enzyme.

22. A cotton plant produced by the method of claim 21.

23. A cotton plant, or part thereof, having all the physiological and morphological characteristics of the line 02Z55, representative seed of said line having been deposited under ATCC Accession No. PTA-\_\_\_\_\_.

24. A method of introducing a desired trait into cotton line 02Z55 comprising:

- (a) crossing 02Z55 plants grown from 02Z55 seed, representative seed of which has been deposited under ATCC Accession No. PTA-\_\_\_\_\_, with plants of another cotton line that comprise a desired trait to produce F1 progeny plants, wherein the desired trait is selected from the group consisting of male sterility, herbicide resistance, insect resistance and disease resistance;
- (b) selecting F1 progeny plants that have the desired trait to produce selected

F1 progeny plants;

- (c) crossing the selected progeny plants with the 02Z55 plants to produce backcross progeny plants;
- (d) selecting for backcross progeny plants that have the desired trait and physiological and morphological characteristics of cotton line 02Z55 listed in Table 1 to produce selected backcross progeny plants; and
- (e) repeating steps (c) and (d) one or more times in succession to produce selected second or higher backcross progeny plants that comprise the desired trait and all of the physiological and morphological characteristics of cotton line 02Z55 listed in Table 1 as determined at the 5% significance level when grown in the same environmental conditions.

25. A plant produced by the method of claim 24, wherein the plant has the desired trait and all of the physiological and morphological characteristics of cotton line 02Z55 listed in Table 1 as determined at the 5% significance level when grown in the same environmental conditions.

26. The plant of claim 25 wherein the desired trait is herbicide resistance and the resistance is conferred to an herbicide selected from the group consisting of: imidazolinone, sulfonyleurea, glyphosate, glufosinate, L-phosphinothricin, triazine and benzonitrile.

27. The plant of claim 25 wherein the desired trait is insect resistance and the insect resistance is conferred by a transgene encoding a *Bacillus thuringiensis* endotoxin.

28. The plant of claim 25 wherein the desired trait is male sterility and the trait is conferred by a cytoplasmic nucleic acid molecule that confers male sterility.